SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

No. 1444.—Vol. XXXIII.] LONDON, SATURDAY, APRIL 25, 1863. [WITH JOURNAL] STAMPED.... SIXPENCE. UNSTAMPED. FIVEPENCE.

FEARFUL ACCIDENT AT THE BOTALLACK MINE—NINE LIVES LOST.

We have this week the painful duty of recording the saddest accident which has ever happened in connection with the mining enterprise of the neighbourhood in which it occurred. The hazardous labour of extracting minerals from the earth constantly claims its victims; at one time it is the premature explosion of a hole, at another a treacherous slip of ground, which makes some home desolate; but the case is isolated, and the dropping of lives at intervals does not shock the district like a fell catastrophe such as that we have to describe. By it, in one minute, nine men and lads were hurried into eternity. Their week's labour ended, husbands were on the point of again meeting their families, young men their companions—one of them, at least, to gladden the eyes of a widowed mother—and lads, released from their grim toil, were on the point of enjoying themselves in the cheerful daylight, when, by the snap of a single link, all were dashed to pieces—a cruel death, which yet was merciful in its freedom from many pangs. The scene of this disaster was Botallack—a mine renowned throughout all the world for its metallic treasures and its romantic situation. Worked under the sea from time immemorial, Botallack has always had an interest for us as a hive of submarine industry.

"Beneath the deep Atlantic's spacious bed,
On either side its cavern'd paths are spread."

Its romantic situation—its machinery lashed by the waves of the Atlantic—and the specimen it has afforded of industry and perseverance successfully battling against the inert obstacles of Nature, have always made it a favourite resort of the tourist. Henceforward a gloomy association must cling to it, and the stranger will gaze awe-struck and saddened down the mouth of a shaft where, on Saturday last, the life was suddenly crushed out of nine poor bodies, and health and vigour were transformed into death and miserably maimed corpses.

To describe minutely the causes of this calamity, it will be necessary to speak of a gigantic piece of recent engineering work on this mine. Approaching the cliffs from the manor-house of Botallack, passing (and at every step gradually descending) by account and store houses, thundering stamps and busy floors, with mining tackle and erections of wood and stone every here and there, the edge of the cliff is at last gained, and you look down at the lowest engine-house—the Crowns; so called from its proximity to three rocks of compact hornblende known as the Crowns. This is by the water's margin, on your left. In your downward pathway stands a newer edifice. It is a winding-engine house. There is powerful machinery inside, with a system of leverage by which the winding process may be stopped or checked promptly. As you skirt the side of this house you perceive a massive cage, round which in many a coil rests an iron chain, which hangs across one of the numerous coves the waves have here fashioned, and enters a wooden-framed orifice in the opposite cliffs. You may pass over this 40-fm. indent in the rocks by a platform of massive beams, inclining from one precipice to another at an angle of 22½°, and you then pause before a square tunnel of uninviting aspect. Down this darksome passage—its sides dripping, and a faint stream of exhalation constantly emitted from its throat into the open air you now enjoy—many a visitor, impelled by curiosity and a love of the new, as well as by the facilities it gives for penetrating the earth, has passed. Prince Arthur and his suite, their merriment roused by the grotesqueness of their garb, slid down here last year: three weeks since Lady Falmouth and her daughter made the same plucky venture; and the laughter of ladies and gentlemen is now no uncommon sound, as at th's place they say good bye to the merry sea and sunshine, and are hurried into the long and sinuous tunnel, which by a uniform angle throughout of 32½°, and in a direction 10° west-of-north, passes you (in 14 fms.) under the bed of Neptune, and carries you a distance of 400 fms., and a depth of 192 fms. into Earth's recesses. This is the Boscawen diagonal shaft. You may explore it afoot, but why weary yourself? Just below the cage and its burden of chain is a skip, or tram-carriage, one end attached to the series of iron links which bandage the cage. It is long and low, and its seats will just hold eight persons. It is 2 ft. 6 in. high, but the shaft is 6 ft. high, and there is no fear of knocking your head. Its low wheels promise immense strength and enough speed. It is made of cast-steel, you need not mistrust its power; it carries 16 cwts. comfortably. Nor need you doubt the chain that binds you to the engine. The first 200 fms. are of links of best charcoal iron, ¾ in. in diameter; its next 100 fms. are of 9-16ths, and its last 100 fms., the whole being 3 tons in weight, are 5-8ths of an inch thick, the entire length welded and prepared by the Messrs. Holman, at their busy foundry near. But lest a link should part, see this ingenious contrivance to check our steel carriage instantly. A spiral spring of immense power is fixed under, and at the back of, the skip. It communicates with a lever which rises like the handle of a beer-engine in front of the wagon; also with two immense claws, their inner edges serrated, which run one on each side of the rails, which rails are 2 ft. 7½ in. apart. Your conductor releases that lever from a catch, and holds it in his hand. Supposing he felt that your course was too impetuous, he would let go the lever wholly. It flies towards you with a clang. Each rail has been caught by the crab-like nippers with a giant's wrench. Your car is fixed. For this safeguard you are indebted to Capt. J. Rowe, of this mine. It is ingenious, and over and over again, experimentally and in emergency, has not failed. So now, trusting yourself to all this strength and precaution, away with you, down the shaft. Nine angles will you turn as you follow the former bed of a copper lode, which lay once between the blue killas and the red decomposed killas, but has made room for this veritable underground railway. There is a clank of chains and a rush of air—sometimes chilly, sometimes warm—as you descend, but, on the whole, you glide smoothly downwards, until you have 1100 ft. of rock between you and the boulders of the sea-bed. You can alight, and inspect the wonders of the mine.

But this immense and expensive tunnel, made by an outlay of thousands of pounds, was not intended for visitors' convenience. To draw the worthless deads and valuable ore to the surface, and to save the exhausted miner the depressing toil and the frequent accidents of the ladder-way, were primary objects. By its means, it is hoped, great depth may be attained, and this part of the mine be well developed. But to science and labour has to be added experience, ere perfection be gained. Oh! woeful pity that experience should be bought by the sharp severance of life, and the groans of widowhood and orphanage.

The miners descend and ascend to various levels by this tramway—each lot having a captain of the skip, who holds the lever of the breaks in his hand. On Saturday afternoon three parties had to come up. They assembled at the 165 fathom level. First come first served is the order of the day. Nine were in the skip, when Thomas Wall, jun., came up and said a lad named Chapple must come out, as he (Wall) had to attend a funeral. Chapple demurred; Wall pressed; the party reached the surface in safety. Nine more formed the second lot, and the lad Chapple was now with his father. At the time we write there are rumours as to what passed between this second party and their comrades underground: we must let the evidence at the inquest speak for this. The skip had reached the 135 fathom level, when a link of the chain near the mouth of the shaft parted. It struck the signal wire at the side of the shaft, and as it parted the wire the faithful signal struck one (the sign to the engineman to stop), and the winding-machinery stood still. At the same time the severed chain was seen to bound from the shaft's mouth. Simultaneously the miners in the 165 heard the fearful rush of the released carriage and its human freight, with the attached chain. The ill-fated skip passed them with the rush of an avalanche—filling the shaft with dust and sparks of fire. They at once guessed the destiny of their unhappy neighbours, and some of them hastened to the top, some downwards.

Those who came to the surface were forestalled in their note of alarm by John Wallis, the filler of the skip, and John Gilbert, the engineman, who dispatched a messenger to the managers. Mr. S. H. James was on his road home from the smelting-works; Mr. S. H. James, jun., had left for Scilly. Capts. Hocking, John Rowe (the engineer of the mine), and John and Henry Boyns (underground agents) were all at the account-house. Their first exclamation was "Never mind the parting of the chain, the men are all safe." So confident were the agents of the security imparted by the "break," that Capt. John Boyns was dispatched from the account-house to the Boscawen shaft, while the others finished their work. But by the time a messenger had reached the account-house, and Capt. Boyns had gone down to the shaft, one of the men who awaited his turn at the 165 had gained the surface, and said they were all gone to the bottom and killed. The horrible news soon spread: By 4 o'clock it reached the Church town, and thousands assembled on the mine for definite intelligence. Provided with means for bringing any maimed men to the surface, if still alive, Capt. Boyns and a band of timbermen and miners descended. At about 3 fms. above the 190 they came to the body of a lad named Richard Nankervis, of Bojewyan, aged 13: he lay on the left-hand side of the shaft, on his back, and was quite dead. A blow on the left part of the front of the head had killed him. A little further on lay John Eddy, aged 17, in the centre of the road, his head towards the hill; his head, arms, and ribs were all frightfully crushed.

We must now explain that the rails ceased at the 192; the diagonal shaft was partially sunk 17 fms. below this, but not cleared up and railed. Of course, without an accident, the skip had no business below the 192, and here heavy beams of timber projected to facilitate the loading of the skip in the 190. There was an opening only 2 ft. 9 in. high from the perfect shaft to the imperfect continuation of it. The skip is 2 ft. 6 in. high, and had still seven occupants, who could not possibly crouch down in it, and so avert the fate which certainly awaited them. The fearful and wholesale crash must have been at this point, and the woodwork bore witness to its horrors. If the pace at which they had run down, and the anticipation of their fate had not already stunned the men, here death was sharp, but momentary. As the skip passed under the woodwork the beams decapitated, or nearly so, the men, and the battered skip and disfigured bodies fell here and there in the rubbish at the very lowest point of the mine. Of the nine angles in the diagonal shaft, the principal ones are above the 150. In their downward course the men passed one safely in the 150. Thence to the 180 was a straight course; here there was a slight turn, but in all probability the skip did not leave the rails until its final plunge from the line, under the sollar, to the bottom. The distance traversed by the skip, gaining impetus at every fathom, was about 100 fms. Its axles were both broken, and it was otherwise much knocked about. Worse than that, under the skip lay Chapple—a steady, quiet man—and his son, quite dead. Chapple had been struck in the face and on the left arm. He lay on his left side. Peter Eddy, a young man of 17, lay over the tail of the skip—part of his body in and part out of the iron carriage; his head was gone, and the sollar had evidently struck him. Four others were 7 feet below the wagon, lying one by the other, and all fearfully injured in head and body. The recoverers of the body were of opinion that all were killed at the aperture we have spoken of. We have now to give a list of the victims.

John Chapple, of Nancherrow, 50; and John Chapple, his eldest son, aged 16. A widow and several children are left. Chapple was a widower and his wife a widow when they re-married.

Peter Eddy, of Nancherrow, 17, the son of a widow with six or seven other children.

Michael Nicholas, of Botallack, leaves a widow and seven children—the poor woman *enceinte*. John Eddy, of Botallack, 18.

Thomas Wall, 46, of Carnyorth, and Richard Wall, 19, his son, a widow left and several children.

Thomas Nankervis, of Trewellard. Richard Nankervis, of Bojewyan.

Thomas Nankervis's fate was a sad one. Up to the day of his death he had never been in the wagon or the shaft, but had worked in Wheal Hazard part of the mine. That morning he asked Capt. Boyns for a stem, as he could not work with advantage on his own job. Captain Boyns said he could not tell what to put him about, but, on the suggestion of Matthew Thomas, he was put to "trammay" at the 165—to clear out an old level, and secure better ventilation for Thomas's pitch. The poor fellow lost his life by his industry.

The fate of the nine miners was soon known at the surface, but hundreds remained on the spot. It took many hours to regain and attach the chains, and probably to secure the bodies. It was after midnight when a tram came up to the cage and disclosed five bodies; and it was about two o'clock when the remaining four were placed on boards and conveyed home. The news reached Penzance about six o'clock on Saturday, simultaneously with that of another death at St. Just United, and another at Tolvadden, and excited much sorrow. It was easy to understand the gloom which fell on the parish, where all these men and boys were known. In one of the first small houses at the left of the road as you leave St. Just for Botallack, lay father and son, surrounded by weeping relatives. A little further on there was another house of mourning; strong men were unnerved. The services at church and chapel were particularly solemn, and few eyes were undimmed by a tear. At the Wesleyan Chapel the Rev. Joseph Spencer expressed his total inability to preach; but, having read the last six verses of the 13th chapter of St. Mark, he spoke, from his own knowledge, of the piety of some of the deceased, and drew from the awful occurrence the solemn lesson it so impressively conveys. The stranger who arrived on the mine at once saw the saddest evidence of the event. Men were busy in the carpenter's shop as you passed down to the mine, and on your return nine coffins were ranged side by side, awaiting their luckless tenants. Of the causes of the accident we cannot at this moment write; but several questions will, no doubt, arise at the inquest, on Tuesday, and will afterwards engage the most serious attention of the managers of Botallack. The strength of the chain, its liability to fracture, and the substitution of a stronger one, or a rope of wire or hemp—the efficiency of the breaks and the necessity or otherwise of four, instead of two, for every wagon—the probabilities whether the deceased were watchful or negligent with their lever, and whether the breaks acted or not—are all matters upon which our own theories would tend to no practical good. Several of the men who work at the mine—among them Eddy's father, in the presence of his dead son—expressed to us their confidence in the skip and break if the captain of the wagon was attentive to his lever, and released his rail-nippers at the first alarm. On the other hand, many men in St. Just have mistrusted the diagonal shaft from the first, and prophecied the accident which has happened. The chain has parted previously, and the skip been brought up promptly. Every kind of experiment has been tried; and the miners frequently stop their tram and alight at a higher level than that they intended seeking, without any difficulty. We may rest assured that the efficiency of the contrivance will again be severely tested, and that the managers of the mine will—for their own sake and for the sake of humanity—leave nothing undone to prevent the recurrence of so sad an accident. If the men themselves also have been inattentive to their breaks, they will surely bear in mind the fearful warning given them on Saturday last.

THE INQUEST

was held on Tuesday morning, before Mr. Wm. Hichens, coroner for the district, at Bolitho's Queen's Arms Inn, at Botallack. The jury were the Rev. G. Hadow, foreman; and Messrs. John Bennetts, James Akerman, George Chenhalls, John Lethan, John Wallis, James Bennetts, William Hodge Saundry, Nathan White, William Williams, James Bolitho, and William Trehair. Having been sworn, and briefly addressed by the coroner, it first became their painful duty to witness the victims of Saturday's accident. Repairing in carriages provided for them to Nancherrow, they viewed the bodies of Chapple and his son, and of Peter Eddy—the last a fine young man. At Botallack village they saw Michael Nicholas and the lad John Eddy. And in the northern part of the parish they inspected the remains of the other four. Of course all presented, more or less, a very shocking sight; and to witness father and son lying in one small room did not diminish the harrowing nature of the spectacle. While the injuries were generally of a fearful character, it was too evident that the sollar, or timber projection we have referred to, had guillotined the poor fellows who kept their seats in the "gig." In several instances the entire top of the head had been swept away. On their return from this mournful—we may say revolting—duty, the jury reassembled at the account-house on Botallack, a fine room, and admirably adapted for an inquiry of the kind. Among those who assembled, in addition to the jury, were Messrs. E. H. Rodd, W. Borlase, Rowland Davies, S. Higgs, R. V. Davy, S. York, E. Davy (sheriff), J. Matthews (Penzance borough surveyor), S. H. James, sen., S. H. James, jun., C. Twite, &c. At the inn we observed D. P. Le Grice, Esq., the Rev. G. R. Scobell, &c., and those gentlemen afterwards came to Botallack. Mr. Davies announced that he attended professionally to watch the case for the adventurers of Botallack, and to assist in giving every information. The coroner called over his list of jurymen and of the deceased, and said the enquiry was to sift the cause of death, and see if anyone were to blame. At the same time he entreated all of them to get rid of any unfavourable prejudice, and to allow any rumours they had heard only so far to be present in their minds as to guide them to proper questions.

The first witness called was THOMAS NANKERVIS, who was sworn, and said:—I am a miner of St. Just, and work at Botallack. I was at work on Saturday last in the 160 fm. level of the Crowns part of the mine, where I saw all the deceased men and boys: they left off work and got into the tram in the 160: I put my little brother (Richard Williams Nankervis) into the tram, and saw the party start: never saw them again until I found them dead in the 190: I saw fire pass down the shaft—I suppose from the chain—but no skip or men: heard a rush as if a wagon was going with great swiftness, and then thought it my duty to go and see after those I knew to be killed: within 3 or 4 fathoms of the 190 I found my brother, nearer the 190 John Eddy, John Chapple and his son, one each side of the wagon; 2 or 3 fms. below that, Peter Eddy in the wagon (his body and head hanging over), and the other four one upon another within 2 or 3 feet of the wagon, and below it: all were dead. My brother Henry said to the breaksman, "Take care, your shoulder is too near the break:" Thomas Wall was the breaksman on that occasion. Wall answered, "It is all right:" no one altered his position in consequence of that observation.—By the FOREMAN: The skip always starts from the 160, where there is a regular landing-place for the men, whether they work above or below that level.—By the CORONER: I am in the habit of using the break, and have often found it answer immediately.—By Mr. AKERMAN: Wall was a steady man, and as he got in used to put his hand on the break: should not be afraid to go in again after this accident, if everything was right: the break often acted by itself: it was always kept out of the loop for fear anything might happen, and when they went away the break was out of the loop or catch.—By the FOREMAN: It is a clear way from the 160 to the 190, and no impediment, so that a person riding need not stoop: we need not trouble to stoop anywhere in the shaft, if we are sitting down: there was a new piece of road at the 190, to put in some more of the shaft, and the men struck themselves against this. My brother once jumped in her, in my presence, as she was going past the 130 to get to the 160, and brought her up by the break at once, although she was going at full speed.

Capt. JOHN ROWE: I am one of the mine agents and the engineer of Botallack, and know well the machinery by which the men were riding, as I am the inventor. There is a diagonal shaft 363 fms. long, from the entrance in the cliffs to the 190; it is 32½° from the horizontal; we have an angle of 23½ at the 80, but there are four rollers at this corner, each 4 ft. 10 in. in diameter. There are 29 angle rollers in the shaft altogether; the shaft is 5 ft. wide by 6 ft. high at an average; the tramway is 2 ft. 7½ in. apart. At the angles there is in some places a width of 13 ft. The tram is worked by a chain from the surface, connected with a whim-engine, and that chain passes over rollers at the bottom and sides of the shaft, so that it never touches any plane surface. Knew the chain well. We have worked it 13 months. It was warranted, but not tested. It weighs 17½ lbs., 21½ lbs., and 26¼ lbs. to the fathom, according to the size. It was made quite new, and for this particular service. Our first size is ⅝ in. for 100 fms. from the drum, the next 100 fms. is 9-16ths, and the next is 200 fms. of ½ in., which runs to the furthest extent of the water. The first place, of ⅝ in., has to pull the rest of the chain, as well as the carriage. The broken link produced is 9-16ths in.; this is the one that produced the damage; it is weakened by surging on the cage; four or five links have pressed one upon another. I think the quality of the iron good. At Government works they test chains, but we do not. I see injury to this link, but no defect in the iron itself. I think three or four rounds of chain were one upon another on the cage, and then the top round suddenly slipped on one side. This strained the link in question. We have a sliding loop in the bottom of the carriage. There is a spiral steel spring attached to levers on each side of the carriage, and these levers are connected with grippers, which catch the rail. This spring is of immense power. With a leverage of 12 to 1, it takes a good man to pull the spring on and when the lever is liberated the spring falls back as quickly as the trigger of a gun which causes two grippers of 2 in. in diameter (with claws which run along the narrow part of the rail) to grip the rail, and the carriage is at once checked. I do not think the snap of the chain prevented the grip from operating. My own impression is that the lever was in the loop, and when the chain snapped the men could not move the lever, and became paralysed. We have tried the grip in every way, and never could make it fail. I am sure if the tram had run 50 fathoms I could bring it up, and there is no mark of any grip having fastened on the rail, although Capt. Boyns and I searched minutely for the least mark twice yesterday. We cannot stop the tram going up; our grip is only for descending. I think we may prevent this in future by insisting that the lever shall be out of the loop in ascending. The whole affair was over in from half to three-quarters of a minute, and if there was any hesitation they were lost: 10 men were slipped 11 fms. the other day, and brought the tram up in 1 ft., without any great violence. The carriage and men on Saturday weighed 22 cwts. I do not know the velocity. A gentlemen in the room said the speed was 100 miles an hour. My impression is the poor men lost their lives by the handle of the break being in the catch, and their not using it. Two men were killed, perhaps, by trying to get out of the carriage. The rest were killed, but I do not know by what means. They neglected to keep the handle out of the catch, or it would have been self-acting.

JAMES EDDY: I am a miner, living at Botallack; was at the higher part of the mine when this happened on Saturday. Under Capt. Rowe's instructions put in the work in this shaft, and well know the machinery and how to work it: knowing the operation of the break, and that it is self-acting when properly fixed. The handle of the break is generally in a guard, and if in the guard when the chain broke it would not act; when loose the slightest movement would cause it to act. This took place on Thursday last, when I was in the gig: there was a little surge in the chain, and it acted instantly—in fact, I never knew it to fail. I thought myself quite as safe in that gig as in my own bed, when I had the lever in my hand. Thomas Wall understood and liked the lever very much. The tension of the chain would not prevent the break self-acting. I have a son lying dead from the accident; if I had been in the gig, or Thomas Wall had the lever in his hand, my mind tells me that my son would be alive now. I feel so much confidence in the gig that I am sure the handle was in the loop, but the handle can be sent out of the loop by a spring.

The witness having added that he had nothing more to say, but was ready to answer any question,

The CORONER asked the jury whether they required any further evidence after this last piece of testimony?

Mr. DAVIES said they had 20 witnesses to prove the confidence of the miners, and many scientific gentlemen to show the trustworthiness of the machinery.

The CORONER said the simple question was, how did the unfortunate affair happen, and was blame attributable to anyone? Explanations had been given of the working of the machinery—were those satisfactory? The question whether deceased had done all they could to prevent accident would always be conjecture, but without attributing blame to them the thing might be purely accidental. The main question was—Is there neglect on the part of the managers of the mine? If not, there was an end to the enquiry.

Mr. DAVIES said he had witnesses to prove that several of the deceased men had themselves expressed the greatest confidence in the skip.

The jury thought they had heard sufficient evidence, but requested a few minutes for deliberation. The Court was cleared. On re-assembling, the FOREMAN said: We have found a verdict of "Accidental Death." We recommend that a subscription be opened on behalf of the widows and orphans, and that the adventurers be requested to head the subscription list. I shall be happy to do what I can in the parish.

Mr. JAMES said no doubt the adventurers would subscribe handsomely. The adventurers were prepared to prove the chain was sufficiently strong, and was not working at a fifth of the strain it was calculated to bear.

Mr. DAVIES added that Messrs. Brereton, sheriff, and John Matthews had inspected the works, and had pronounced them efficient, but the adventurers would gladly attend to any suggestions calculated to make them still more efficient.

Several jurymen expressed their confidence in the machinery, and the adventurers present having subscribed 50*l.*, the enquiry ended.

Meetings of Mining Companies.

EAST CARN BREA MINING COMPANY.

The bi-monthly meeting of shareholders was held at the offices of the company, Threadneedle-street, on Tuesday,

Mr. C. JOHN FURLONGER in the chair.

The SECRETARY read the notice convening the meeting, as well as the minutes of the last, which were confirmed. The accounts showed—

Ores sold	£3518	7	1			
Fines	2	5	0			
Advance on tribute	100	0	0			
Calls received	910	8	0	= £4531	0	1
Balance last audit	£ 477	7	8			
Mine cost and merchants' bills	2335	4	2			
Royalty (six months)	529	3	9			
Advance on tribute	100	0	0			
Sundries	22	9	4	= 3464	4	11
Leaving a credit balance of				£1066	15	2

The assets were—Balance as above, 1066*l.* 15*s.* 2*d.*; arrears of call, 289*l.* 12*s.*; copper ore sold, March and April, 2424*l.* 19*s.* 5*d.* = 3781*l.* 6*s.* 7*d.*: against which the liabilities were—for engine, bill due end of May, 1793*l.*; royalty, 200*l.*: leaving balance of assets over liabilities, 1788*l.* 6*s.* 7*d.*

The agents' report was then read, as follows:—

April 20.—In the 60, driving east of the cross-cut, the lode is 3 ft. wide, composed of spar, intermixed with copper ore, of a very promising appearance. In the 60, west of the cross-cut, the lode is divided; the south part is 1 foot wide, producing 1 ton of ore per fm. In the winze sinking below the 50 the middle lode is yielding 2 tons of ore per fathom, worth 10*l.* per ton. In the 60, driving east of the cross-cut, the north lode is 18 in. wide, mixed throughout with copper ore. In the 50 we have intersected the south lode to the east of the cross-course, which is 3 feet wide, yielding good stones of copper ore; in driving a few feet we shall be able to speak of its value. In the winze sinking below the 50 the south lode is 3 feet wide, yielding 3 tons of ore per fm. In the stopes in the back of the 50, on the south lode, the lode is yielding 7 tons of ore per fathom. The new shaft is down 5 fms. 4 ft. below the 40, in which the lode is 2 feet wide, composed of fluor-spar and copper ore. It is rather early for us to make an estimate of our next sampling, but we calculate it will be about 300 tons.—Tutwork Setting for April: The old engine-shaft to sink below the 60 by nine men, at 25*l.* per fm. The 60 to drive east, on north lode, by four men, at 5*l.* per fm. The 60, to drive east on middle lode, by four men, at 7*l.* per fm. The 60, to drive west on middle lode, by four men, at 5*l.* per fathom. The winze to sink below the 50, west of the cross-cut, on middle lode, by four men, at 4*l.* 10*s.* per fm. The 50, to drive east on south lode, by six men, at 7*l.* per fm. The winze to sink below the 50, on the south lode, by six men, at 4*l.* per fathom. The 50 cross-cut, to drive south of the south lode, by four men, at 3*l.* 10*s.* per fm. The new engine-shaft, to sink below the 40, on south lode, by nine men, at 8*l.* per fm. The stopes in back of the 50, east of the cross-cut, on south lode, by six men, at 2*l.* 5*s.* per fathom. The rise in the back of the 26, west of the new shaft, on the south lode, by two men, at 3*l.* per fm. The 26, to drive east, on south lode, by two men, at 4*l.* per fm.—T. GLANVILLE, J. SCHOLAR.

Mr. P. WATSON asked how it was the royalty charged in the balance-sheet amounted to so large a sum?—The CHAIRMAN explained that it was for six months; although the accounts were made up bi-monthly it was not always charged.

Mr. P. WATSON thought it ought to have been charged regularly; the item of 529*l.* in the present balance-sheet was a very heavy one, and out-adventurers would hardly understand what it meant without some explanation.

The SECRETARY said that the amount as charged was strictly correct. The same principle was adopted in Wheal Basset and South Frances; the royalty could not be charged bi-monthly, as the statement was a cash account, and, if so charged, would not agree with the bank book. The words "six months" should, however, be placed against the item, and the period inserted in future.

The CHAIRMAN, in moving the adoption of the accounts and report, said there were several shareholders in arrear of calls, amounting to 289*l.* 12*s.*, a list of whom was on the table for the shareholders' inspection. He (the Chairman) felt ashamed of men of that stamp allowing their calls to remain in arrear, and felt inclined to advise their forfeiture; they gave great trouble to all concerned, and certainly acted very unjustly to those shareholders who were willing to, and did, pay their calls. With regard to the accounts, the cost had been rather heavier than anticipated, owing to the erection of the engine. For the next two months they calculated the cost at rather under those of the part two months—viz., 2000*l.* They had also to meet the bill for the engine (1793*l.*), the last of their liabilities, making 3793*l.*; against this they have the credit balance of 1066*l.* 15*s.* 2*d.*; arrears of call, 289*l.* 12*s.* (to recover which the committee were determined to use every step in their power); ores sold March, 1662*l.* 3*s.* 6*d.*, and April, 762*l.* 15*s.* 11*d.* These items would leave a balance in hand of 11*l.* 13*s.* 5*d.* He (the Chairman) thought, therefore, that they should be able to part on the present occasion without making a call.

In reply to a Shareholder, the CHAIRMAN stated that the whole of the costs were charged to the end of February last.

Mr. GUNDRY said that he had recently visited the mine, and was much pleased with its present appearance. They were now sinking the shaft, which operation had been delayed until the erection of the engine; they were now able to sink to any depth, and it would not be long before they were down to the 70, the ground being easy to sink through, and no timber required.

Mr. P. WATSON enquired how far they had to drive in the 50 to intersect the lode?

Mr. GUNDRY said that there were several lodes to be intersected in the present drivin one of these was expected to be cut in about 6 or 8 fathoms further driving; this lod

had been seen in the adit, in which place it was about 3 feet wide, whole to the surface. This lode was south of their south lode.

In reply to Mr. P. WATSON, the CHAIRMAN stated that the estimated profit on the next two months' working was about 300*l*. There was a good course of ore in the bottom of the 50, which they hoped shortly to get under in driving the 60.

The accounts and report were unanimously received and adopted.

A vote of thanks to the Chairman terminated the proceedings.

NORTH DOWNS MINING COMPANY.

A general meeting of shareholders was held at the company's offices, Broad-street-buildings, on Wednesday,—Mr. DUNSFORD in the chair.

The notice convening the meeting having been read, the minutes of the last were read and confirmed.

A statement of accounts for the four months, including the Feb. cost, showed a loss of 384*l*. 6s. The balance of liabilities over assets was 273*l*. 16s. 5d.

Mr. F. PRYOR (the manager) read the report, as follows:—

April 20.—King's engine-shaft is down 6 ft. below the 72. The lode at the 72 is underlying north, and as we intend sinking the shaft perpendicularly we shall not be able to see the lode until we reach another level, and a cross-cut put out to intersect it; should the lode, however, change its underlie, and which is we think very probable, we should then be able to sink on its course. We are pushing on this shaft with all possible dispatch with a full pare of men, as we think the chances of the lode for making better when we get further off the elvan course. The 72 is extended east of [illegible] fms.; the lode is 2 ft. wide, and producing stones of ore. The 72 is driven west of shaft 5 fms., and suspended for the present, and the men put to sink the engine-shaft. The 60 is extended 56 fms. east of shaft; the lode is at present split into branches by the influence of a part of Bennetts' cross-course, which we have just passed through in this level, but the main part of Bennetts' cross-course is about 6 fms. before us, and seeing we had a good lode of ore at the level above about this point we see no reason why we should not have similar results in the present end, as the character of the ground and the nature of the lode are everything that can be desired for making ore. The 60 is extended west of King's shaft 48 fms., and also at present suspended, and the men put to cross-cut north to cut a part of the lode which we find (by sinking a winze from the 50) is standing in that direction, which we believe to be the main part of the lode, as we have three tribute pitches working at the 50, and near this point, which are looking very well. Bennett's shaft is down 6½ fms. below the 50, and had we not met with the elvan in sinking we should by this time been down to the 60; notwithstanding, however, that this has impeded our progress, we hope to be down to the 60, and a cross-cut put out, and the main lode intersected at that level (the 60) in about four months from this time. The length of this cross-cut, according to the underlie of the lode in the level above, will be about 7 fms. Looking at the character of the ground in this shaft, and the dip of the slides, we have I think every reason to expect something good when this important feature is accomplished. The 50, east of Bennetts' shaft, on the main lode, is extended 25 fms.; the lode is 2 ft. wide, and worth 6*l*. per fm. The lode in this end has for the greater part of this drivage been mixed up with the slide; the lode has, however, been productive for all this drivage, and has opened up good tribute ground; we have one pitch working in the back of this level, at 6s. 8d. in 1*l*. The 40 is driven 60 fms. east of Bennetts' shaft, on the main lode; this end has also been productive for nearly all this drivage, and has opened up good tribute ground. The 30 cross-cut is still being driven north to cut North Treskerby and other copper lodes, and as we have frequently spoken of the great importance of this point of operations we need not, we presume, enter into the matter again to-day; suffice it, however, to say that we are still as sanguine as ever as to the desirability of pushing it on. We have cut a branch in this cross-cut, and have driven on it 4 fms., which is so far unproductive; it is letting out water freely, and, therefore, we are induced to open on it, but the main feature is still before us, and, therefore, the cross-cut is being pushed on with a full pare of men. You will perceive from this report that our mine is not rich, and up to this time our bottom levels have not come up to what we had a right to expect, yet you will see we have several very important points to come off. First, there is a chance (and we really think it no ordinary one) of the lode improving in King's shaft as we get off the elvan; second, the importance of the lodes when intersected from Bennetts' shaft at the 60, as the character of the ground is precisely of the same character as it was in the 50, where we had our riches. We have employed on tutwork 75 men, and 46 on tribute, and about 30 persons dressing at surface, making a total of 151 hands. Our ends have for some time not been rich, yet our samplings have been regular, and the quality of the ore not reduced, thus showing that our estimate of the reserves made some time since was on the right side, and had the standard kept up we should be in a much better financial position than now. Our pitches are looking tolerably well, and we are getting on very well for our next sampling.—FRANCIS PRYOR, JOHN GRENFELL.

** The MANAGER said that he thought there was good reason to believe, from the change taking place in the character of the ground, that the same course of ore would be met with under the elvan course as had produced such riches above it.

A SHAREHOLDER noticed that the cost-sheet had not been reduced.

The MANAGER said he had had to contend against that over which they had no control—a reduced price for copper. As regarded the tin (or Peever) portion of the sett, the operations had not been extended in that direction, in consequence of the water, for there was no machinery at that part of the mine. If a good course of ore were cut in the 70, they would have the means to purchase a small engine to be erected upon Peever, where the water was very easy.

Mr. T. KING said that was a point worthy of consideration.

The MANAGER said he never saw North Downs look more promising than it did about a fortnight since.

Mr. KING inquired at what point they purposed to drive the next level?—The MANAGER replied that it was his intention to sink the shaft another 10 fms., so as to entirely clear the elvan course. In about two or three months he thought they would cut the North Treskerby lode.

A SHAREHOLDER enquired if it would be an expensive matter to drain the Peever Mine?—The MANAGER replied that there was a communication between Peever and the adjoining mine, so that if they attempted to drain Peever, they would drain the water from the other property. Otherwise it would require a very small outlay to drain Peever. He had heard that an engine was about to be placed upon the property to which he referred.

The report and accounts were then received and adopted.

The CHAIRMAN said the next question was one of ways and means.

The MANAGER, in answer to a question, stated that, assuming the standard to be the same as at present, during the next four months the result of the operations for that period would be about the same as during the corresponding period just passed, for about as much ore would be raised.

After some conversation, a call of 2s. 6d. per share was made.

A SHAREHOLDER enquired of the manager what he considered the value of the mine?

The MANAGER said, before he replied to that question, he might inform the meeting that the value of a mine had nothing whatever to do with the market price of the shares. All he could say was, that the mine would be worth more this day four months than it was at the present time—he meant intrinsically, for he could not answer as to the market price of the shares.

A SHAREHOLDER enquired if the manager had the same opinion with regard to Peever as at the last meeting?—The MANAGER replied in the affirmative, and stated that he could find a purchaser ready to give 5000*l*. for it.

A vote of thanks to the Chairman terminated the proceedings.

LADY BERTHA MINING COMPANY.

A general meeting of proprietors was held at the company's offices, St. Helen's-place, on Thursday,—Mr. UPTON in the chair.

Mr. LAVINGTON (the secretary) read the notice convening the meeting, and the minutes of the last were read and confirmed.

A statement of receipts and payments for the three months ending March showed a cash balance in hand of 345*l*. 6s. A statement of assets and liabilities (including the estimated expenditure for the next three months) showed a balance against the mine of 815*l*. 12s. 10d.

The report of the agents was as follows:—

April 21.—We beg to hand you the following particulars of the above mine for the forthcoming quarterly meeting of shareholders. Since your last meeting we have suspended all operations in the bottom, or 53 fm. level, until such time as we shall have communicated the winze sinking below the 41 east with that level, which will ventilate both levels. In the 41 east the lode will average for the last 12 fms. driving about 2 feet wide, composed of mundic, peach, and ore, worth for this distance from 8*l*. to 10*l*. being thrown to the north, where I am glad to say we have again discovered it, from 18 inches to 2 feet wide, consisting of peach, mundic, prian, and ore, coated with black oxide, worth 2 tons, or 6*l*. per fathom—a very kindly lode, and likely for further improvement as we advance eastward; driving by six men, at 8*l*. per fathom. In the winze sinking below this level (41) we are down about 8 fms., at which point the lode is 2 feet wide, carrying mundic, capel, iron, and occasional stones of ore, leaving about 3 fms. more to sink in order to reach the 53; we have six men employed in this place. The men hitherto belonging to the 30 fm. level east are now employed rising above the back of the level towards the new shaft; when we last cut through the lode in this end it was about 18 inches wide, consisting of ore and mundic, worth of the former 1½ ton, or 4*l*. 10s. per fathom; as soon as convenient we shall resume the driving of this end. The ground in the rise above the back of this level is at present favourable for exploring; we have six men engaged here. In the stopes in the back of this level (30 east) the lode is about 3 feet wide, composed of mundic, peach, and ore, worth of the latter 3 tons, or 9*l*. per fathom; stoping by four men. In the 20 east we have been driving by the side of the lode for some short time past; when last cut into it was worth 1 ton, or 3*l*. per fathom; it is proposed to cut through it again shortly; four men are working in this end. We have a pitch in the bottom of this level in operation by four men, where the lode is from 3 to 4 feet wide, composed of quartz, mundic, iron, and ore, worth of the latter 4 tons, or 12*l*. per fathom. At the new eastern shaft we continue to progress favourably, now down 6 fms. below the 30 fm. level, the ground being a light coloured clay-slate, with small veins of prian, intermixed with mundic, and at times small spots of yellow copper ore, which we consider congenial for the production of mineral in depth. We are pushing on the sinking of this shaft with all possible dispatch by nine men, and hope, should the ground continue as it now is, to effect a communication with the 30 fm. level in about four months from this date. In the tribute department we have no material change to communicate, yielding about the same as usual, having seven pitches in operation by seventeen persons. In the wheel-pit we are getting on pretty well with the excavation, having fixed a tramway for taking off the stuff, and are also progressing favourably with the driving of the lobby towards it, for taking off the water; the wheel, axle, &c., are also on the mine, and we hope to take the advantage of the coming spring for this work, and get on with the masonry work for wheel-pit as soon as we conveniently can, erect the machinery, &c., so that when we reach the 40 fm. level with the shaft no time may be lost in sinking deeper, as at that point we may expect water, it being important to get down and develope this part of the mine as soon as we possibly can. We have employed in and throughout the mine ninety-five persons; the wheel and machinery are all in good working order. Our sale of 162 tons of ore, computed, will take place on Thursday next, and are preparing for another sale as fast as we can. We are also getting on with another cargo of arsenical mundic.—F. C. HARPER, J. WETHERELL.

The CHAIRMAN, having moved the reception and adoption of the report and accounts, said that the mine was in no worse position than three months since. The improvement which led to the rise in the price of the shares at that time had been but of a temporary character. He then explained that during the current four months they expected to effect a communication with the 30 fm. level, when the effect of the large cross-course upon the value of the mine would be known—if their expectations were realised, that would prove of paramount importance in the future history of the mine. As to the accounts, it had been seen that, including the cost of the next three months' [illegible]ations, there would be a balance against the mine, so that upon the present occasion it would be prudent to make a call. He need not tell his fellow-shareholders that their unfortunate drawback had been the low price which their copper ore had realised. There was one thing which, to his mind, spoke favourably for the future—he referred to the fact that a gentleman of influence in the mining market had recently so considerably increased his stake that he was now the largest shareholder; that was to him (the Chairman) a source of great congratulation.

Mr. STEELE, in seconding the adoption of the report and accounts) said that he considered the prospects of the mine had improved. They were driving three levels, in each of which ore was being found; and the 40 appeared to be producing richer quality ore than the other levels. There were about 15 fms. yet to drive to reach the great cross-course, upon the realisation of which their hopes had been based for a long time past. The nature of the ground was very congenial for the production of mineral.

Mr. PETER WATSON, in answer to a question, stated that very little ore ground had been taken away, compared with the amount opened.

The CHAIRMAN said that nothing could be said at present about the 30 east, because it had been suspended for the purpose of putting up a rise—that, he considered, one of the most important points in the mine.

Mr. PETER WATSON said that the great feature in the mine was the sinking of the shaft so as to communicate it with the 30, which, no doubt, would be done during the coming four months. He might, perhaps, mention that, in reality, the 30 was 60 fms. from surface. Of course, as soon as the shaft had been communicated with that level, driving would be commenced towards the cross-course. Remembering that this was the champion cross-course of the country, it was by no means an unjustifiable assumption that its intersection would open up a new and satisfactory career for Lady Bertha.

The CHAIRMAN, in reply to a question, said that if they had sold their ore one month since, the accounts upon the present occasion would have shown three months' costs against three months' returns; but as they now stood there were three months' costs against two months' returns.

Mr. WETHERHEAD had understood at the last meeting that the cost of the water-wheel was charged in the accounts then submitted.

The SECRETARY explained that in the last accounts the cost of the water-wheel was charged as a liability; but that in the present accounts half the amount was given as a payment, and the remainder as a liability.

The CHAIRMAN said that the actual financial position of the undertaking at the present time was that it was solvent to the extent of 200*l*. The call the committe proposed to recommend was to meet the requirements of the next three months.

The reports and accounts were received and adopted.

Upon the proposition of Mr. HODGE, seconded by Mr. PETER WATSON, a call of 3s. per share was made.

The CHAIRMAN stated that the arrears of call at the present time amounted to 100*l*. Had it not been for the fall in the standard the mine would have paid its costs during the last twelve months.—The committee of management were re-elected.

A vote of thanks to the Chairman terminated the proceedings.

GREAT BARRIER LAND, HARBOUR, AND MINING CO.

An extraordinary general meeting of shareholders was held at the company's offices, Bishopsgate-street, on Tuesday, for the purpose of authorising the issue of 20,000*l*. worth of debentures, in pursuance of the Articles of Association. Col. JOHN BAZALGETTE in the chair.

Mr. MURCHISON (the secretary) read the notice convening the meeting; and the subjoined report, which had been previously circulated amongst the shareholders, was taken as read:—

Your directors deem it right to explain to you briefly the present state and prospects of the company, as well as the objects for which they consider that further capital should at once be provided. According to the advices from the manager, the saw-mill was expected to be at work last month (March), and a contract had been entered into for the cutting of 1,000,000 feet of Kauri timber in the Wairahi Forest, at the rate of at least 100,000 feet per month, which had been commenced, and was proceeding satisfactorily. This is in addition to what is being prepared in the Kaiarara district. One or two more dams have also been found necessary, so that, as before reported to you, the fact that the working of the mill has devolved on the company instead of on a lessee, as at first proposed, has rendered necessary a larger outlay of capital than was anticipated. Your directors congratulate you on this part of the undertaking being at last probably in operation, from which a return may henceforth be expected, which will give a high rate of dividend on the whole capital of the company. The farms progress, and the sheep and cattle increase in number and value, but an immediate further outlay of capital ought to be made on these objects. Your manager writes that the farms will now bear a larger addition of stock, and he regrets that the funds at his disposal will now allow him to go on clearing, and thus make more land available for farming and grazing. It is unnecessary to remind you of the early, large, and almost certain returns which may be looked for from a judicious outlay in this direction. The operations of the firewood cutters, mentioned in paragraph nine of the last report, render an increased expenditure desirable on clearing and sowing the land from which the wood has been taken. If this be done at once the cost will be but slight, but if delayed the clearing will, from the rapid growth of underwood, &c., be more expensive than if the ground had never been touched. Mr. Heaphy, the provincial land surveyor, in his late report on Crown lands on the Great Barrier Island, refers to "the facilities of boating, and the abundance of fish off the coast," and your manager has alluded to the same subject in several of his letters. Your directors are, therefore, pleased to find that he has commenced a fish curing establishment, on a small scale to begin with, until he sees how it will answer. The following is an extract from his last despatch:—"The fish curing experiment progresses. I am sending up to-day to Auckland about 7 cwts. of salted snappers and rock cod. They are beautifully cured, and if I can command a fair price for the article our operations are capable of extension to any amount—to the extent of my power to obtain labour. Some of the natives are anxious to be employed in catching fish, but I am waiting to see what price they will fetch. There is no doubt any quantity of fish can be procured."

In some of his earliest despatches your manager pointed out the difficulties to which he was exposed from the want of regular communication with Auckland. These he attempted to meet from time to time, but abstained from urging too strongly on the directors the only effectual remedy—the purchase of a vessel—as he felt that the funds of the company were required for objects of more immediate and pressing necessity. Your directors, however, believe that no further delay should take place in procuring a suitable vessel. Now that the saw-mill is at work it would be particularly useful, and it could be made profitable in many ways, while it would secure regularity of communication with Auckland, and would remove the prejudice which has existed to some extent hitherto among the labourers of the province against taking employment at the Great Barrier, arising from the comparative difficulty and uncertainty of access and departure. As an investment it would almost certainly pay itself in a very few years. Your directors, having had the offer on favourable terms of a block of 666 acres of land, contiguous to, or rather nearly surrounded by, your estate, have not hesitated to send out instructions to conclude the purchase; the desirability of this step will be obvious to anyone who will glance at the map of your estate, which accompanies this report.

The objects mentioned above have been partly, and will, your directors believe, be fully, met by the moiety of the 20,000*l*. of debentures which they now propose to create; but there are others highly important, which will most probably offer themselves forcibly to the attention of your directors, and the carrying out of which would rapidly raise your property into one of very great value.

The question of encouraging emigration to the Great Barrier has occupied the serious attention of your directors, and has been suggested to them by Mr. Allom (your manager), by the Governor of the colony, Sir George Grey, in conversation with him, and by the report of Mr. Heaphy, the provincial land surveyor, dated Feb. 11, 1862, already referred to. You will readily see that a settlement of emigrants on the island would be of the utmost consequence to your property. Mr. Heaphy remarks that, though the land is generally very hilly, the soil is good, and that in the various bays of the east coast, &c., are many spots where 40-acre men, with their families, might cultivate successfully, and in other positions that much larger farms might be laid out. He says that "the coast is well adapted to the requirements of ship and boat builders," and that "the facilities of boating and the abundance of fish off the coast, indicate the Great Barrier as the fitting site for a settlement of men from the western coast or islands of Scotland, or from the western coast of Ireland." He suggests that the Great Barrier Company might become the means of introducing from Europe a body of emigrants of a fitting class, and thus form a special settlement. Your manager has been in communication with the superintendent of the province on this subject, with the view of ascertaining on what terms the Provincial Government would make a grant to this company of part of the Crown lands on the Great Barrier island, in case they should introduce a certain number of suitable emigrants from Europe, who might be located either on new lands to be granted by the Government, or on the present property of the company, as may be thought most desirable. Your directors consider that if reasonable terms are offered by the Government they should be accepted, though the scheme would require a considerable expenditure. The more regular supply of labour, the increased demand for the produce of your farms, the greatly-enhanced value of your land, and the certainty of obtaining, in grants of land, a full, or nearly full, compensation for the outlay in sending out and settling the emigrants, are self-evident arguments in favour of a well-considered plan of this nature.

Your directors are gratified at having the views they have repeatedly expressed to you on the admirable position and unusual advantages of the company's harbour, Port Fitzroy, recently confirmed in an emphatic manner by experienced persons of considerable authority. In a work, lately published (entitled the "Gate of the Pacific"), by Commander Bedford Pim, R.N., he gives a plan of the harbour, and speaks of it as "unexceptionable." His remarks, that "its situation at the mouth of the gulf, in the direct track of the capital, Auckland, is such as to make it a very desirable port of call for the mail steamers employed in the proposed route (*viâ* the Isthmus of Central America—indeed, the terminus of New Zealand, which lies within the shortest line of passage, is undoubtedly the Great Barrier Island, where there is every facility for coaling and obtaining supplies, if necessary, and the detention of the mail steamers might be made of the most trifling nature." The following extracts of recent letters from your manager relate to this question. Under date Oct. 20, 1862, he writes:—"I think it my duty to call the attention of the directors to the fact that the question of the route from England to New Zealand, *viâ* Panama, is again being very generally agitated throughout the colony. * * * There can be no doubt, setting aside all predilections, that a line drawn upon the globe between Sydney and Panama, representing the track of a vessel traversing that part of the ocean upon the great circle principle, would be shorter than any other that could be drawn between the two places. I am not sure whether this line would not actually cross the Great Barrier Island. * * * The Mail Company would, of course, stipulate for the terminus in New Zealand, lying within the shortest line of route, and that is really and truly the Great Barrier Island." And again, on Dec. 22, 1862, he says:—"In a conversation with the provincial surveyor, I find that he recommended the Great Barrier Island as the most suitable place for steamers to call. Some years ago, when the Royal Mail Company, or some other steam company, sent out an agent to make enquiries on the subject, Mr. Heaphy tells me that he expressed to the agent his belief that the Barrier is preferable to any other port in New Zealand for the above purpose. I am decidedly of that opinion, and I trust the directors will leave no stone unturned to accomplish this object. The New Zealand Legislature have voted 30,000*l*. a-year towards carrying out the project, and, if you can induce the Royal Mail Company to take the matter up, and choose the Barrier as their point of call, the future advantage to the Barrier Company will be very great. * * * For a long time the supplies of coal for such a line would have to be drawn from New South Wales. Now, it is obvious that a collier would rather discharge at the Barrier than sail up the gulf to Auckland. This is an important item to be considered, and the cost of a coaling depôt in Auckland would be very great."

You are, perhaps, aware that the Postmaster General of New Zealand, and an agent of the colony of New South Wales, are now in this country, with the view of inducing the British Government to join these colonies in a subsidy to a Panama line of steamers. New Zealand and New South Wales having already agreed to give £30,000 a year, Your directors need scarcely say that this matter occupies their unremitting attention, and they will spare no exertion to realise its accomplishment, which would be of immense results to the company, and compared with which the necessary outlay would be trifling. Before leaving the subject of the harbour, your directors would remark that the establishment of the saw-mill is likely to be the means of attracting trade and population, and forming the nucleus of a township. Mr. Heaphy observes that "the most valuable portion of the Great Barrier Island lies round Port Abercrombie (Fitzroy), and is owned by the Great Barrier Company."

Several shareholders have lately represented to your directors that they had received information that gold existed on the Great Barrier Island, and your manager has also expressed his opinion to the same effect; while the probability of such being the case is strengthened by the close proximity of the celebrated Coromandel gold fields. A relative of one of our directors, who went out to the colony last year, writes under date December 17, 1862, "I am certain if a level were driven through the main chain that runs through the island, that a reef would be struck and gold found there. Murphy's chain, the richest in Coromandel, is in the same line of mountain, and only a little bit of sea divides the Great Barrier from it." Your directors may also mention that by an assay lately made of some ore or quartz from the copper mine gold has been found, and important information on this subject may be looked for by every mail. Your directors are not yet able to report progress in the proposed sale of the copper mine, but they still hope that an arrangement may be made by which this company will receive a considerable sum in cash, and also a further amount in paid-up shares in any company that may be formed for that object. They feel sure that the mine can be made highly remunerative with a judicious outlay of capital. Your directors have devoted their chief attention hitherto to the erection of the saw-mill, as from that source they felt that a considerable return would be at once obtained. As it is likely that the mill is now at work, they deem it of much importance to develope with spirit the other objects above referred to. The present farms should be improved and others established, the stock of sheep and cattle should be considerably increased, the fish curing establishment ought to be largely extended, a suitable vessel should be purchased, while your directors should be in a position to carry out the project of a special settlement if favourable terms are offered, and also to lay out any necessary and reasonable amount in preparations for landing wharves, and other requisite facilities for rendering Port Fitzroy a fitting port for steamers and other vessels, and as a depôt for whalers.

By the circular of Sept. 30, 1862, you were informed that, under the power conferred on them by the 27th clause of the Articles of Association, your directors had determined on the issue of debentures to the extent of 5000*l*.; but later advices from the colony, and the consideration above described, having rendered a larger outlay highly desirable, they have thought it better at once to ask your authority to raise 20,000*l*., which will be secured by debentures issued for a period of five years, bearing interest at the rate of 6 per cent. per annum, free of income tax, and be a first charge on the company's property. Your directors propose, however, to issue only 10,000*l*. (including the 5000*l*. mentioned above), and to call you together again before issuing any of the rest. By adopting the plan of debentures repayable in a moderate number of years, your directors hope that the resources of the company will enable them to pay off the amount, and thus avoid a permanent addition to the capital of the company.

In conclusion, your directors beg sincerely to congratulate you on the condition and prospects of the company. Fresh openings for judicious enterprise are from month to month developing themselves, and you have a manager whose zeal, energy, and judicious conduct have won the confidence of your directors, and entitle him to yours. As a proof of the position which he holds in the colony, it may be added that the Governor has appointed Mr. Allom a Justice of the Peace for the province of Auckland. It is the very success of the undertaking which demands and justifies an additional outlay in the further development of the resources of your estate. Your directors believe this to be the turning point in the history of the company, and they feel the fullest confidence that you will not only give them authority to raise the sum asked for, but that you will yourselves subscribe at once the full amount. It were superfluous to speak to you of the ample value of the security offered, while every pound raised will be devoted to the improvement of your own property, and will, in all human probability, produce large and immediate returns.

Dr. DEARLE enquired from what source it was intended to pay the interest on the debentures, as unless that were stated they could scarcely expect that the shareholders would subscribe for them?—Mr. WRIGHT stated that the saw-mill was probably now at work, and that alone would yield enough to ensure the payment of the interest, and in addition a good dividend to the shareholders. The debenture holders would likewise be secured by a mortgage of the freeholds of the company, so that they would have ample security.

Dr. DEARLE suggested that it would be desirable to defer the consideration of the issue of the debentures until the annual general meeting, by which time they would have the accounts for the last year before them, and be in a better position to judge of their prospects.

A SHAREHOLDER seconded the proposition, and as the time for holding the general meeting was so near at hand, he could not see that the postponement would make any material difference to the directors, or interfere with their financial arrangements. There was a loss on the previous year's working, and he thought that before they were asked to subscribe for debentures they should know the state of the accounts for 1862, and whether they showed a loss also.

Mr. WRIGHT said that, although it was obvious that the accounts which would be presented at the forthcoming meeting would show no available profit, there was really no loss, because the expenditure had all been *bonâ fide* outlay, and the value of the property was improved to the extent of, and more than the extent of, such outlay. They had intended to work their farms by tenants, who were to find the labour, the company finding the stocks, but in consequence of the failure of most of those tenants to carry out their arrangements the company had been compelled to take the farms into their own hands. The saw-mill was likewise to have been erected and worked by contractors, but the company had had to undertake it, and there had been an outlay upon it during the past year. That this change in their arrangements necessitated the expenditure of more money than they anticipated could not be questioned, but they would reap the full benefit of the outlay hereafter. At present all the expenditure must come out of capital, and there has been nothing returned yet, except a small quantity of wool, and a small return from the saw-mill and sawn timber. The whole of the balance of capital last year was really expended on revenue account.

A SHAREHOLDER thought, if they had confined themselves to the saw-mill, they would have been able to have had a dividend by this time. He feared the energy of Mr. Allom and the money of the company had been too much expended upon experiments. He thought that they should not attempt to isolate themselves by buying up all the land that happened to be offered, as by doing so they were really driving away those who were likely to bring labour into the island. At Auckland there was a good demand for timber such as they could supply, and if they could ensure a supply there were shipowners who would be glad to come for it.

Mr. WRIGHT conceived the objection to be that Mr. Allom's energies had not been directed to those pursuits which would immediately pay; but he could tell them that, from the day Mr. Allom went out, the directors had pressed upon him to confine his attention mainly to the saw-mill at first, as it was likely to be the earliest source of large profit, and no money had been expended upon other objects which would have been spent on the saw-mill. It would, however, have been impolitic to say that Mr. Allom should see to the erection of the saw-mill and to nothing else. The delays had arisen from circumstances beyond control, principally from the difficulty in obtaining skilled labour. The cutting of firewood had cost little, and it induces a communication with Auckland. They were really not going into purchases of land, but the piece of land on Wairahi Creek was really necessary for the objects of the saw-mill. They had had only the Kaiarara forest to work upon, but they would now have the Wairahi also, so that no contingencies would prevent their continued progress. The purchase of the 666 acres was to be effected for 333*l*., or 10s. an acre; and so convinced was Mr. Allom of the desirability of acquiring the property, that he had rented it for a year at 25*l*., to give him time to communicate with the directors. As to their being wharfingers, he supposed the allusion was to the Panama route, as it was only in the event of the Panama route being adopted, and of Port Fitzroy being chosen as a port of call for the mail steamers, that it was thought it might be necessary to erect wharves, &c., and in such a case he believed the company would be but too glad to provide the necessary capital for giving accommodation, as they would be quickly repaid to an almost unlimited extent, for it was impossible to say what their 25,600 freehold acres would then be worth. As to their fishing trade, it consisted in encouraging two men to come over from Auckland to cure fish, and the greatest loss to the company, even in case of failure, could only be 50*l*., though, if successful, it would be extended.

After some unimportant conversation as to the principle upon which capital and revenue accounts were separated from each other—Mr. WRIGHT explained that the increased value of the sheep would not come into the accounts to be presented at the next general meeting, although the full amount of the outlay would. The proposition to postpone the consideration of the debenture question was withdrawn, and it was unanimously resolved to give the directors the requisite authority.—A vote of thanks to the Chairman terminated the proceedings.

PRICES OF MATERIALS,

As charged at the EAST MARGARET MINE, during the following months:—

	November.	December.	January.
Borer cast steel.....per cwt.	50s. 0d.	12s. 0d.	—
4 inch patent nails ..... „	—	—	19s. 9d.
White lead..... „	—	24 0	—
Leather .....per lb.	1 10	1 10	—
Dram balk timber .....per foot	0 11	—	0 11
Yellow pine ditto ..... „	1 4	—	—
Longsound ditto ..... „	—	—	0 10
Coals .....per ton	12 6	12 6	12 6
Best candles (carriage free)..per doz.	5 6	5 6	5 6
Tallow (ditto) .....per cwt.	51 0	—	—
Grease (ditto) ..... „	22 0	22 0	—
Rape oil (ditto) .....per gallon	4 6	—	—
Olive oil (ditto) ..... „	—	5 6	—
Powder (ditto).....per 100 lbs.	50 0	50 0	—
Safety-fuse (ditto).....per coil	4d. 5d.	—	—
Rope (ditto) .....per cwt.	44 0	—	44 0
Hemp (ditto).....per lb.	0 5	—	0 5

IMPROVEMENTS IN RAILWAY CROSSINGS.—We understand that Mr. Abraham Rogers, of the Farnley Wood Colliery, near Leeds, has presented a memorial to the committees of the Lancashire and Yorkshire and Great Northern Railways, in which he submits for their consideration an improved form of switch rail and railway crossing, which has the recommendation that it is constructed with the same kind of rail as that used in the regular road. Mr. Rogers states that the train will pass so smoothly over the new crossing that it will be almost impossible to tell that a crossing is being passed, there being no jolting whatever. The crossing is perfectly applicable with wheels of the present form, and it is proposed that until the change is complete no alteration should be made, when, however, all the new crossings are in, Mr. Rogers would prefer the wheels to have two flanges, since, although one flange is a safety, he thinks two are a great deal better, the friction being equally divided between the two flanges. With such an arrangement the road could never get out of gauge, and would wear both the right and left hand rails alike. Mr. Rogers thinks it a very great oversight that they have not had two flanges on the wheels, instead of one, from the first introduction of the railway system, and as in the course of conversation with various good authorities, both in London and elsewhere, who invariably tell him that with the present crossings this is impracticable, he has designed the new crossing referred to. He has not secured the invention by patent, but is very desirous that its adoption should become general, unless it be shown that the objections are greater than the advantages.

TRIAL OF A TRACTION ENGINE.—Mr. George Wilkinson, engineer, South-street, Newcastle, has almost completed an exceedingly compact traction engine, which has been tried with very successful results, exciting unbounded admiration and interest. The engine has been constructed for Mr. F. Ayton, of Hindley, from his own designs. The boiler is upright, its cylinders are vertical, and 4½ in. in diameter, its stroke is 10 in., and motion is communicated to the wheels by an endless chain. The engine is worked by a crank motion, and can be reversed or stopped in a second; and the steering apparatus combines extreme simplicity with great efficiency.—*Newcastle Daily Chronicle.*

GIGANTIC IRON CASTING.—A large anvil block was cast at the foundry of Messrs. Fawcett, Preston, and Co., which in its complete state will weigh about 60 tons. The total quantity of metal melted was about 70 tons, and the whole was effected by the ordinary appliances of the establishment.—*Liverpool Albion.*

MONEY MAKING—No. II.

The ingots, after a corner piece has been cut from each for the purpose of assaying, are carefully weighed, and then delivered into the Mint stronghold. In this safe place they remain until the assayer to the establishment shall have made his report as to the character of each ingot, the identity of all being preserved by stamping them with letters. Assuming that these operations have been satisfactorily performed, a batch of ingots is next passed through the scales of the Mint office, in presence of the Master Melter, who then receives them, with the assayer's report, and writes a receipt for them. In trucks, and by a tramway which existed long before Mr. Train invaded the metropolis with his abortive scheme for facilitating street traffic, they are now conveyed to the melting-house. Not satisfied with the weighing of the precious freight which has taken place at the central office, the officer in charge of the smelting department passes the whole again through his own scales, taking care to note exactly—to the hundredth of an ounce, in fact—and to record in his own journal, the weight of the ingots as he finds it. This done, they are submitted to the hands of the workmen, who transfer them forthwith in detachments of six, with such an amount of copper alloy as the "report" shows to be necessary, into plumbago crucibles. In the gold-melting house there are seven furnaces, each of which is 12 in. square and 24 in. deep, and not unfrequently 50 loaded crucibles are passed through them in a single day. In this case the gold so melted and converted into bars for coinage would equal in value 250,000*l*. The crucibles of the Plumbago Crucible Company, Battersea, are found to stand this heavy kind of work better than all others; hence their exclusive use at the Royal Mint. A short period of time suffices for the reduction of the rigid ingots into a rich fluid, and by careful stirring a complete incorporation of the alloy is ensured. The moulds are meantime prepared for its reception. These consist of a series of cast-iron bars, which have been planed from end to end, and fitted together in two halves. They are placed vertically upon a frame, which is supported on wheels, and are firmly clamped together by rods of iron. The moulds are made tolerably hot when prepared for use, and supposing all other minor arrangements to have been effected, the first crucible, with its 4800*l*. worth of molten metal, is raised from its fiery seat. This operation is performed partly by the assistance of a wrought-iron lever, but principally by the "broad and sinewy hands" of the attendant workmen. At this juncture, and after resting a moment at the top of the furnace, which is about 3 ft. from the ground, the crucible is clasped by a hooped iron rod, and then advanced to the mouth of the first mould. The weight of the crucible, it may be said, is partly taken off the arms of the pourer by means of a hook and chain, suspended from the roof of the melting-house: the operator thus has more complete controul over the work in hand; he has, in fact, simply to guide the top of the crucible to the mould, and quickly pour the fused metal into it.

Mould after mould is thus filled, and crucible after crucible emptied. The empty crucibles are re-charged with ingots, and again deposited in the furnaces. Another series of moulds are advanced for filling, are filled, and so the work goes bravely on, until the gold is exhausted. As soon as the bars solidify and set to some extent the moulds are separated, and thus release them. Plunging in cold water is the next process to which the gold bars have to submit, and then they are trimmed by the aid of chisel and hammer, if hapily their edges be at all rough, which is not often the case.

Mechanically speaking, these bars are now ready for the next operation—that of lamination in the rolling-mills. They are, however, again "weighed in the balance," and the loss which has occurred in melting is "made a note of." Each bar, too, is numbered, and has an assay piece cut from its end, for the purpose of ascertaining that it is not "better" nor "worse" than standard. The assay pieces are placed in separate papers, and numbered correspondingly with the bars from which they have been taken. Another assaying takes place, and if this demonstrates the fact that the proper standard has been attained, the whole batch of bars is passed back to the central office, prior to their delivery into the hands of the Chief Coiner, or one of his numerous deputies.

At the office named another weighing takes place, and then the trucks and tramway are again put into requisition for the conveyance of the metal to the great rolling-mills. The bars for sovereigns are cast of a rectangular form, as also are those for half-sovereigns. There is a difference in the size of the two kinds of bars, nevertheless, as will be seen from the following dimensions of each:—

	Length.	Breadth.	Thickness.
Sovereign	21 in.	1¾ in.	1 in.
Half-sovereign	24 in.	1⅛ in.	1 in.

The great rolling-room at the Royal Mint is a rather handsome apartment for such a purpose as that to which it is devoted. It is about 60 ft. in length by 40 ft. in breadth, and perhaps 30 ft. in height. It is light and well ventilated, two rather important points, frequently overlooked in other rolling mills. For many years a 30-horse power engine, made by Boulton and Watt, drove the half-dozen mills which are used for laminating metal intended for the coinage of the realm. Owing, however, to the increased quantity of money required for the purposes of commerce and trade during the last few years, it was deemed necessary, in 1858, to apply more power to the rolling-mills; and Messrs. John and Edward Hall, of Dartford, accordingly erected a 40-horse engine for that purpose. This engine, which is in all respects an excellent one, is on the combined high and low pressure principle.

So much for the mechanical arrangements of this department of the Mint. Let us not in examining into them lose sight of the gold bars, which are presently to be reduced to ribands, so to speak, under pressure of the "chilled" and highly polished rolls before us.

The officer in charge of the rolling-room, before putting the valuable material into the hands of the workpeople, again weighs it. This is done as a check upon the honesty of the latter; and, indeed, weighing is the coiners' sheet anchor. He would be literally "all at sea" unless he knew precisely the quantity of metal given out for working, and, therefore what he should receive again at the close of a day's operations. Having weighed out the number of bars he intends to have reduced to a gauged thickness, the officer in question confides them to the workmen, who forthwith convey them to the breaking-down mill. The rolls of this apparatus are each 14 inches in diameter and 18 inches long in the barrel. The upper roll is counterpoised by weights and levers placed in a tunnel below the mill, and powerful screws above enable the workmen to regulate the distance between the two rolls to a great nicety. It is not necessary to say that the frames of this mill are massive and strong.

Allowing, now, that a truck loaded with gold bars is advanced to the front of the breaking-down mill, and that the space between the upper and the lower roll is so regulated as to administer a severe pinch to a bar 1 inch in thickness if passed between them; then one by one, in rapid succession, the whole of the batch of bars are so passed. The compression imparts a considerable amount of heat to each bar, which was previously cold, at the same time that it reduces its thickness and adds to its length. Workmen, wearing thick gloves, and stationed at the back of the mill, receive the bars as they emerge, and pass them to an iron table, placed conveniently near. When the whole of the bars have been submitted to this first part of the laminating process the mill is re-adjusted, the rolls being made to approach each other more nearly, and an index at the head of one of the mill screws recording the extent of the alteration. Again the bars are passed between the rolls, gaining length and losing thickness, of course, by the ordeal. Again they are returned, and so the process continues, until the erstwhile inch bars are not more than a quarter of an inch in thickness, and of a most unwieldy length. This latter evil is remedied by means of a pair of shears, worked by an eccentric on the underground driving shaft. By these monster scissars the bars are cut into 18-inch lengths, and as the compressing process has rendered the gold very hard, and comparatively non-ductile, it is at this stage annealed. This is achieved by first charging, in companies of five, the shortened bars into copper tubes. The tubes are covered afterwards by caps of the same metal, the joints being "made good" with fire-clay, and then the whole are deposited in heating or reverberatory furnaces. Twenty minutes or half an hour's baking suffices. The tubes are removed from the ovens, and their contents discharged into a cold water cistern, are found to be as soft as lead, comparatively speaking. The dwarfed and annealed bars of gold are now removed to a smaller mill, having finer adjustments than that for the "breaking down," and another series of pinches reduce them still nearer to the thickness finally required. The bars have now become indeed technically "fillets," or ribands, and by the assistance of a gauging mill, of yet smaller dimensions than those previously referred to, and by the constant application to their edges of a graduated steel gauge they approach very nearly to the thickness of a sovereign. At this point a careful weighing up of the material takes place, so that it may be passed forward to the department next in order in the process of coining. Satisfied that he has received, in one form or another, the whole of the metal which in the shape of rough bars he gave to the rollers, the officer of the room dismisses the latter to their homes, and transfers the results of their labours for further manipulation to his brother officials in the "drag-room."

FOREIGN MINING AND METALLURGY.

M. Perny de Maligny has just published an interesting pamphlet in regard to the working of metallic mines in France, which he contends is one of the countries best endowed by nature in regard to mineral substances. The absolute wealth drawn annually from the bosom of the earth in France exceeds 6,400,000*l*., while the capital represented by the various working companies is not more than 27,200,000*l*. The annual dividends paid by these companies considerably exceed 2,000,000*l*., although more than one-third of the carboniferous bearings are still unproductive. If from the total of 27,200,000*l*. we deduct the 4,000,000*l*. forming the capital of companies working foreign mines of copper, lead, zinc, &c., which are still in a comparatively unsatisfactory stage, it follows that the capital embarked in mining in France, which is thus reduced to 23,200,000*l*., produces a return of more than 16 per cent. If the 4,000,000*l*. forming the capital of these foreign workings had been applied to the working more closely of French metalliferous bearings, France would have been assured the rank which she ought to take in metallurgical industry. Nature, so prodigal towards France, could not be niggardly only as regards minerals, and this is proved by the multitude of mines of every kind which are worked, discovered, and recognised on French territory. Thus France possesses about 100 mines of copper, 400 mines of lead, 6 of silver, 7 of tin, 30 of antimony, 20 of gold, 5 of mercury, 25 of zinc, 50 of manganese, 3 of chrome ore, 8 of cobalt, 3 of nickel, 3 of bismuth, 10 of arsenic, 25 of graphite, and 26 of bitumen. The mines of iron exceed 2000, and, besides 800 peat and turf bearings, immense carboniferous bearings, worked at more than 300 points, have given, and still give, results superior to those of the Continent. On 2000 bearings of iron in France, 1590 only are worked, or eight-tenths, while on 740 mines of metals other than iron only 51 are in working, and even this result has been attained very recently, the working having only comprised 19 in 1850. It is not to be supposed that this state of things is due to the fact that workings of copper, lead, zinc, cobalt, nickel, tin, gold, silver, &c., would give benefits below those obtained from iron mines. "No," emphatically exclaims M. de Maligny, "a thousand times no." Why, then, he proceeds to enquire, does the opinion generally prevail that Germany, Hungary, Sweden, Italy, England, &c., possess more mineral riches than France? Simply because those countries, less rich than France in other commercial products, have experienced more urgently the necessity of according to this branch of industry a greater degree of attention. If a comparison be made with states celebrated for their mines, such as England, Prussia, Hesse, &c., it will be seen that the absolute mineral wealth of France is very superior to any of those states, both as regards extent of territory and population. Spain alone could be opposed to France as regards the exceptional richness of its metalliferous bearings, and can only be opposed to France in the matter of combustibles. Notwithstanding this superiority, which is undisputed by all practical men, French capitalists have remained indifferent, to a considerable extent, in the presence of all this mineral wealth, and have applied a large portion of their capital to the working of foreign mines, relying on the promises of ignorant engineers, who have made pompous reports on bearings often wholly unworkable. M. de Maligny contends that it is time that French capitalists should be put on their guard against these fanfaronnades.

The Paris copper market is less active, and transactions have been rather difficult. English has made 89*l*.; Lake Superior, 104*l*.; Chilian, 86*l*.; Corocoro, 89*l*.; red rolled, 100*l*.; yellow ditto, 90*l*. With the exception of the sale of 10 tons of Minesota, in two lots, at 100*l*. 10s. to 101*l*., transactions have been insignificant at Havre. At Marseilles, Toka has been quoted 92*l*., and Spanish, 88*l*.; red rolled copper, for sheathing, 89*l*.; yellow ditto, 86*l*. The outlet for copper has proved limited at Hamburg, and holders not pressing the sale, and demanding, besides, high prices, the article has offered little interest. Berlin has been very firm, the demand for consumption being more active. Cologne and Stettin have remained calm at former rates. The activity which has prevailed in tin of late has sensibly diminished; transactions have become less numerous, and the prices last noted have displayed some tendency to fall. At Amsterdam and Rotterdam Banca remains offered at 77 fls., and would be obtained below those terms. The Paris market has displayed less animation; the last quoted prices were—Banca, 132*l*. 16s.; Detroit, 130*l*. 4s.; and English, 121*l*. The stock of Banca on hand at Hamburg is small, and prices are sustained at a high point; English, on the other hand, has been obtainable at former rates, although holders display a tendency to raise their terms. Berlin and Cologne have remained without change, the demand having slightly diminished. The Paris lead market has undergone no change, but the article is not in great demand; rough French has been quoted 23*l*. 4s.; Spanish, 22*l*. 8s.; and rolled, 25*l*. 4s. per ton. The quotation at Marseilles remains as follows:—Saumons, first fusion, 19*l*. 4s.; ditto, second fusion, 18*l*. 16s.; shot, 20*l*. 4s. per ton. On the Hamburg market soft German enjoys some demand for exportation, and prices, with a very reduced stock, are well sustained. At Berlin the demand has been good, and prices have displayed a hardening tendency. Rotterdam has remained without change. Zinc has been neglected at Paris, and prices have been feeble, rough Silesian standing at 19*l*. Notwithstanding a slight improvement in the English market, a little improvement is noted at Hamburg and Breslau, and at those two centres there has been a slight revival in the demand, and a greater firmness in prices.

The Belgian iron trade is not very animated, nevertheless there is reason to hope that the calm which has prevailed for some little time will soon give place to greater briskness, and producers are not entering into very heavy engagements, in the hope of an early revival of activity. It is announced that several works which had made concessions on rolled irons have raised prices again to 6*l*. 8s. per ton, while orders for casting pig and plates are also slightly improving. Oilgiate minerals have experienced a rise of 10d. per ton, having advanced from 10s. to 10s. 10d.; hydrated minerals have not varied. The exportation of minerals is steadily expanding, having risen to 20,903 tons in February, against 15,443 tons in February, 1862, and 13,708 tons in February, 1861. The important contracts for rails which MM. de Dorlodot Frères have obtained since the commencement of the present year having raised their engagements to a very considerable total, it is expected that they will find themselves under the necessity of extending their rolling-works at Châtelineau; but as a set-off against this, it is announced that the rolling-works of the Société Anonyme de Châtelineau will be in the market in July. A bridge of 140 feet span, just thrown across the Sambre, near the Châtelineau station of the East Belgian Railway, has been severely tested during the last few days, and has satisfactorily resisted the trials to which it was exposed. It was constructed by M. Paris, at Marchienne-au-Pont.

In the Haute-Marne district, in France, affairs remain very quiet, and pig is almost nominal, at 5*l*. 6s. per ton. Compared with a price current published a month since, present rates have not experienced any variations of importance. During February, in the present year, 1400 tons of special irons entered Paris, against 1932 in the corresponding month of last year. There were, besides, received in February 1268 tons of cast-iron for constructive purposes, against 990 tons in the corresponding month of 1862. The Marseilles Gas, Blast-Furnaces, and Foundries Company has just declared a second dividend of 5s. per share for 1862; the balance of the dividend for the year will be fixed at the next general meeting, to be held in October. The Carmaux Mines Company is about to pay 9s. per share, balance of the dividend for 1862. The Rive-de-Gier Collieries Company pays a dividend of 10s. per share for the second half of 1862; and the dividend of the Commentry and Fourchambault Forges and Foundries Company has been fixed at 1*l*. 4s. per share. The Mines de la Loire Company pays 6s. 8d. per share for the second half of 1862. The Government has just conceded several hundreds of miles of new railways to the great French companies, a circumstance which must communicate a continued stimulus to metallurgical industry in France, in respect to rails, &c. In one of the official statements with reference to the new lines granted to the Paris, Lyons, and Mediterranean Company we find the following interesting observations with reference to the coal trade:—"The question of working coal is more grave, and requires attentive examination. What is in reality the consumption of coal at Marseilles and the neighbouring localities? In 1861 it was about 326,000 tons. The port and exportation employed, besides, 146,000 tons, or altogether 472,000 tons, of which more than 100,000 tons were furnished by lignites, worked in the department of the Bouches-du-Rhône. It is, then, upon a consumption of about 380,000 tons that competition may be carried on. The collieries of the Gard—that is, those of the Grand Combe, Besseges, and Portes—are the nearest, and naturally occupy the first rank in the supply, and the proportion which they contribute is about three-fourths of the whole. These various basins send their products to Marseilles in competition with each other, and enjoy the same tariff conditions over the system of the Paris, Lyons, and Mediterranean; 30,000 tons only are furnished by the basins of the Loire, and about 44,000 tons annually by England. Such is according to documents forwarded to the Government, and the accuracy of which does not appear to be doubtful, the present state of consumption at Marseilles. It will be seen that the substitution of French coal for English coal is almost an accomplished fact; English coal will always come to Marseilles as a return freight, and the trade has nearly attained the limits below which this kind of imports can descend. As regards the Graissessac coal, the quality is excellent, and enables it to carry on an advantageous competition against English coal, not only at Marseilles, but in the whole basin of the Mediterranean; but the price at the pit's mouth is still too high in order to enable it to acquire a large share in the consumption. The principal destination is now the maritime arsenal of Toulon, which prefers this coal for war ships to that coming from every other source. The consumption has been limited, not in consequence of any exaggeration in the rates current for transport, but rather through insufficiency in the means of working mines. When the working has taken a development bearing a due ratio with the importance of this rich coal basin, the State, which is administrator of the sequestration of the Graissessac and Béziers Railway, will not hesitate to reduce the tariffs, and will provoke on the part of both the Southern and Mediterranean companies common tariffs, which, without recourse to the construction of a new line, will open up in the whole district of the Mediterranean an outlet for the coal of the Graissessac basin as large as the demands of commerce can require."

EXPLOSIVE GASES IN COLLIERIES.—In the adjourned discussion upon the paper read before the Manchester Geological Society, by Mr. T. Farrimond, relative to the Edmund's Main Colliery Explosion, Mr. Horsfall enquired whether carbonic oxide is an explosive gas? Mr. Farrimond replied that their President (Mr. J. Dickinson) thinks so, from a paper he read.—The President put Mr. Farrimond's question to the meeting—Whether an explosion is likely to take place from fire-damp when there are also present gases evolved by the burning coal in the mine? He remarked that Mr. Goodwin had recently had a fire, and could, perhaps, tell them whether the gases evolved were of an explosive nature, or whether a quantity of carbonic acid gas did so neutralise the effect of it as to make it non-explosive.—Mr. Goodwin said he had never seen a case where gases evolved have been explosive. As the President says, they had recently had a great fire, and when he went down to see it first there were 40 yards of surface all in a glow. He took the first step generally taken—shut off all the air; but it had no effect whatever. He then allowed the gases given off and flame to go up the chimney by the return air-course; it fortunately happened that they had a good supply of water close at hand, and means of supplying it. They have a furnace at the bottom, and it goes up a chimney along with the smoke from the underground boiler furnace. Contrary to expectation, the carbonic acid in this case, if any was generated, did not fall to the lowest point; it did not affect the burning in the least.—The President said that his experience of this point was that where the coal does give off fire-damp, and coal, &c., is on fire in the mine, the explosiveness of fire-damp seems to be somewhat diminished; but that fire-damp will still fire, although there may be a fire burning in the mine near to it. He had heard the contrary opinion taken up by one of their members, who contended that it was impossible for gas to explode near to a fire in the mine. But he himself had seen cases where the gas had actually exploded. He had seen it near to the fire exploding in the lamp; and he had heard Mr. Henry Andrew, of Fairbottom Colliery, and others, describe seeing it in this way. But, at the same time, he does not put down to explosions of gas all those outbursts that take place when the fire is shut off for the purpose of extinguishing them. It too often happens that either the pit top or the entrance to the place is shut off so effectually that no safety-valve is allowed for expansion, and the expansion of the air itself forces down or removes those stoppings which are put up for the purpose of excluding air. This is sometimes attributed to explosion which is, after all, but simple expansion and the pressure of fire-damp. We have irrefutable evidence and experience that fire-damp exists under the pressure of several atmospheres. No gentleman has given any answer to the other question, as to whether the colliers should remain in the mine, and he would just remark that when a great explosion takes place in a mine no advice to the contrary would keep any man in his place when he sees a way out of the pit.—Mr. Goodwin remarked that it was contrary to the first law of nature that anyone should voluntarily remain in a remote part of a mine after an explosion. His conviction was that even Mr. Farrimond would do the best he could to get to the shaft, should he ever happen to be in a mine when an explosion takes place.

THE DYAS, OR PERMIAN, FORMATION IN ENGLAND.—At the recent meeting of the Manchester Geological Society, Mr. E. W. Binney read a translation (by Mr. C. F. Ekman, the librarian of the Local Literary and Philosophical Society) of that portion of Dr. Geinitz's new work on the Dyas, which treats of England, with copious annotations by himself and Mr. Kirkby. In introducing the paper, Mr. Binney remarked that the elaborate and highly valuable work by Dr. Geinitz, of Dresden, entitled "Dyas, or the Magnesian Limestone Formation and Lower New Red Sandstone," was probably the most complete work on the subject hitherto been published on these interesting and important formations. Mr. Kirkby, who has added some of the notes, is a gentleman who has devoted much attention to the investigation of these strata in the north-east of England. As a considerable quantity of coal is now obtained from under these strata, and year by year the sinking of collieries under them is likely to be greatly increased, and such supply greatly augmented, their study and investigation is as important as that of the coal measures themselves. It was formerly believed by practical mining engineers that the coal measures did not continue, or were much deteriorated, under the magnesian limestone. Both these suppositions have been amply disproved, not only in the neighbourhood of Manchester, but in many other parts of England; so it is now an established fact that these strata only cover, and in nowise injure, the coal measures lying under them. The translation, although of great importance, is of too technical and elaborate a nature to admit of our giving a useful abstract of it in an article of moderate length; we must, therefore, content ourselves with referring our readers to the part of the society's "Transactions" in which it is printed, and which may be obtained from our office.

LIGHTHOUSE ILLUMINATION.—Few who visited the recent International Exhibition will have failed to notice the brilliant magneto-electric light exhibited by Mr. Holmes in the main passage of the machinery department, and we have now before us an interesting little book by the same gentleman, showing the applicability of the light to lighthouse purposes. He commences with a short history of the instances in which the light has already been used, informing us that it was first exhibited from the High Light at the South Foreland, on Dec. 8, 1858, and for several subsequent weeks, and we have then Faraday's very favourable opinion of Mr. Holmes's light, an opinion the more important as it was founded upon the professor's actual comparative experiments with it. The progress of lighthouse illumination, from the time when the ordinary cresset beacon was in use, is carefully given. Mr. Holmes gives indisputable evidence (that of actual practical experience) that the light can be continuously maintained, and that there is no difficulty in working it; that it is not liable to accident, and that it is not too expensive. He points out the important fact that the secondary functions of lighthouses are best performed by electric light, such as distinctness from temporary lights, or ship lights, and of one lighthouse from another. It is unnecessary to allude to the various details connected with a machine so well known, and generally appreciated, as that of Mr. Holmes, but we may mention that he has given as an appendix to his treatise a series of testimonials from officers, whose words are above suspicion, in the Royal Naval and Mail Packet services, which would effectually remove doubt, did any exist, as to the vast superiority of the magneto-electric light as compared with "all other lights" previously exhibited.

MANUFACTURE OF COPPER TUBE.—A new and improved method of manufacturing brass, copper, gun-metal, bell-metal, and bronze tubes, and tubes composed of copper, combined with other metals, has been provisionally specified by Mr. J. S. Crossland, of Ashton-under-Lyne; it consists in casting the said tubes in hot dry sand, or in hot metal moulds, with hot dry sand or loam cores, in a vertical or inclined position, pouring the metal into the mould from the top. Chaplets or thickness stops or wedges of copper or other metal are placed between the core and the mould. The moulds are made of common moulding sand or loam, and baked in a stove or oven, or the moulds may be made of iron or other metal, and made hot previous to casting. The cores are formed of common moulding sand or loam, having a perforated iron core barrel or stem, upon which the sand or loam is coated and baked in the stove or oven, and put into the mould hot. When cast the tubes are fit for use, but in some cases they may be turned in the lathe. Also in some cases of the tubes being made of bell-metal or gun-metal, and, consequently, too hard for rivetting into the tube plates of boilers or surface condensers, he brazes a hoop of soft brass upon the ends of tubes for the purpose of rivetting them. In casting the tubes, he causes the metal to rise from 1 to 3 ft. higher than the required length of the tube when finished, which extra length is afterwards cut off. Tubes manufactured by this improved process of gun-metal, bell-metal, or bronze are admirably adapted for engineering purposes, and they are applicable in many cases where brass, copper, and iron tubes are found totally unfit, from their perishable nature.

NEW BORING MACHINE.—An invention, which has at least the merit of novelty as a practical application, has recently been introduced at the St. Chamond Mines by Mr. Leschot, which he claims to be adapted for boring rocks for mining purposes. It is stated that one man can bore through granite at the rate of about ½ in. a minute, and that a 10-in. core, 1¼ in. diam. was removed in 13¼ minutes, leaving a hole nearly 2 in. in diameter. The tool consists of a circlet of diamonds set in a steel ring attached to the end of an iron tube. The tubular borer is made to revolve, a downward pressure being, of course, applied at the same time. It is said that many yards of the hardest jasper or granite may be bored without any apparent injury to the diamonds, and that the original cost of the steel ring and stones scarcely exceeds 5*l*., four-fifths of which may be obtained for the remains of the diamonds when worn to the setting.

LONDON: Printed by RICHARD MIDDLETON, and published by HENRY ENGLISH, the proprietors), at their office, 26, FLEET-STREET, where all communications are requested to be addressed. [*April* 25, 1863.